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New records of Nitidulidae and Kateretidae (Coleoptera) from New Brunswick, Canada

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Abstract

The Nitidulidae (sap beetles) and Kateretidae (short-winged flower beetles) from New Brunswick are surveyed. As a result of recent field work and a survey of museum specimens, 46 species have now been recorded in the province, 32 of which are newly recorded in New Brunswick. *Epuraea obliquus* Hatch is removed from New Brunswick's faunal list. The distribution and bionomics of newly recorded species are summarized. The New Brunswick fauna consist of 33 Nearctic species, four Holarctic species, and nine adventive species. Historical early dates of detection of all nine adventive species found in the province are provided.

Keywords

Coleoptera, Nitidulidae, Kateretidae, New Brunswick, Canada, biodiversity, adventive species

Introduction

The Nitidulidae are an abundant and widespread beetle family (there are circa 2,800 species worldwide and 165 species in North America). Many genera are saprophagous and mycetophagous, although some are anthophilous, carrion feeders, inquilines, and even predators (Habeck 2002b; Cline 2005). In Atlantic Canada, the anthophilous genera *Conotelus*, *Colopterus* (Cillaeinae), and *Meligethes* (Meligethinae) are found in the blossoms of various flowers. Species of *Colopterus* (Cillaeinae), *Carpophilus* (Carpophilinae), *Epuraea* (Epuraeinae), *Cryptarcha*, *Glischrochilus* (Cryptarchinae), *Soro-*

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nia, and *Lobiopa* (Nitidulinae) are found at sap flows, decaying fruit, fermenting plant extracts, in subcortical habitats, and other similar decomposing microhabitats. Species of *Phenolia* and *Stelidota* (Nitidulinae), as well as some *Epuraea* are associated with decomposing fungi. Many nitidulids also have been associated with oak wilt fungal mats (Cease and Juzwik 2001). *Carpophilus* often are pests of dried, stored products and can be found in food processing facilities. *Omosita* and *Nitidula* (Nitidulinae) live and breed in carrion. The Kateretidae, in the past frequently treated as a subfamily of the Nitidulidae, are a much smaller family (there are fewer than 100 species worldwide and 11 in North America). Kateretids are phytophagous; larvae feed in seed capsules and adults feed on pollen and flowers of host plants (Kirk-Spriggs 1996; Habeck 2002a).

Despite their economic importance and diversity, Nitidulidae and Kateretidae have received relatively little attention in Atlantic Canada. McNamara (1991) recorded 13 species from New Brunswick, 15 from Nova Scotia, three from Prince Edward Island, and 13 in Newfoundland and Labrador (a total of 28 species in the region) from a total of 101 species then known to occur in Canada. Majka and Cline (2006) surveyed the fauna of Nova Scotia and Prince Edward Island adding 26 species to the Nova Scotia fauna and nine to the Prince Edward Island fauna. As part of continuing efforts to document the beetle biodiversity within Atlantic Canada, we report new records of Nitidulidae and Kateretidae from New Brunswick.

Methods and conventions

Specimens of Nitidulidae and Kateretidae originating in New Brunswick from various collections were examined and identified. Additional published records for species of these families were also integrated into the analysis. Codens of collections referred to in this study include:

CGMC Christopher G. Majka collection, Halifax, Nova Scotia, Canada
CNC Canadian National collection of Insects, Arachnids, and Nematodes, Ottawa, Ontario, Canada
NSAC Nova Scotia Agricultural College, Bible Hill, Nova Scotia, Canada
NBM New Brunswick Museum, Saint John, New Brunswick, Canada
RWC Reginald Webster collection, Charters Settlement, New Brunswick, Canada
UMNB Université de Moncton, Moncton, New Brunswick, Canada

The taxonomy and nomenclature follows Habeck (2002a, 2002b) and Audisio (1993) except that we employ the name Kateretidae Erichson, 1843 rather than Brachypteridae Erichson, 1845 as in Habeck (2002a) for reasons discussed in Cline (2006) and in conformity with Jelínek (2007a). We also treat *Epuraea* Erichson, 1843 as a member of the subfamily Epuraeinae Kirejtshuk, 1986, in keeping with Jelínek (2007b), rather than retaining it in the Carpophilinae Erichson, 1842 as in Habeck (2002b).

Results

Four species of Kateretidae and 42 species of Nitidulidae are now known from New Brunswick, 32 of which are newly recorded in the province (Table 1). One species, *Epuraea obliquus* Hatch, is removed from New Brunswick's faunal list. Specific details of these records follow. For each species, the location, collection date, collector, habitat and ecological information, number of specimens, and collection coden of all specimens examined is reported. This is followed by a brief summary of the distribution and bionomics of the species and any other pertinent information on the status of the species.

Table 1. New Brunswick Kateretidae and Nitidulidae

KATERETIDAE
Brachypterolus pulicarius (Linnaeus) †
• *Brachypterus urticae* (Fabricius) †
• *Heterhelus abdominalis* (Erichson)
• *Heterhelus sericans* (LeConte)
NITIDULIDAE
Cillaeinae
Conotelus obscurus Erichson
• *Colopterus truncatus* (Randall)
Carpophilinae
• *Carpophilus brachypterus* (Say)
• *Carpophilus hemipterus* (Linnaeus) †
• *Carpophilus marginellus* Motschulsky §
• *Carpophilus sayi* Parsons
Epuraeinae
• *Epuraea aestiva* (Linnaeus) *
Epuraea avara (Randall)
Epuraea erichsoni Reitter
Epuraea flavomaculata Mäklin
Epuraea helvola Erichson
• *Epuraea horni* Crotch
Epuraea labilis Erichson
• *Epuraea obtusicollis* Reitter
• *Epuraea peltoides* Horn
Epuraea planulata Erichson
• *Epuraea rufa* (Say)
• *Epuraea rufida* (Melsheimer)
Epuraea rufomarginata Stephens *
Epuraea terminalis Mannerheim *
• *Epuraea truncatella* Mannerheim
Epuraea umbrosa Horn
Nitidulinae
Omosita colon (Linnaeus) †
• *Omosita discoidea* (Fabricius) †
• *Nitidula bipunctata* (Linnaeus) †
Nitidula rufipes (Linnaeus) †
• *Lobiopa undulata* (Say)
• *Thalycra concolor* (LeConte)
• *Cychramus adustus* Erichson
• *Cyllodes biplagiatus* LeConte
Meligethinae
• *Meligethes nigrescens* Stephens *
• *Meligethes simplipes* Easton
• *Meligethes viridescens* (Fabricius) †
Cryptarchinae
• *Cryptarcha ampla* Erichson
• *Cryptarcha concinna* Melsheimer
• *Glischrochilus confluentus* (Say)
• *Glischrochilus fasciatus* (Olivier)
• *Glischrochilus moratus* Brown
• *Glischrochilus quadrisignatus* (Say)
Glischrochilus sanguinolentus (Olivier)
Glischrochilus siepmanni Brown
• *Glischrochilus vittatus* (Say)

Notes: •, newly recorded in NB; †, Palaearctic species; §, Oriental species; *, Holarctic species; no symbol, Nearctic species.

KATERETIDAE, Erichson, 1843

Brachypterus urticae (Fabricius, 1792)

Carleton Co.: Jackson Falls, Bell Forest, 46.2208°N, 67.7211°W, 13.VII.2004, K. Bredin, J. Edsall, & R. Webster, rich Appalachian hardwood forest, on flowers of nettle, (2, RWC); same locality, 1.VIII.2004, V. and R. Webster, rich Appalachian hardwood forest, on flowers of nettle, (4, RWC).

This adventive Palearctic species has been recorded in Canada from British Columbia west to Québec, Newfoundland, and Nova Scotia (McNamara 1991; Majka and Cline 2006), and in the United States along the Atlantic seaboard south to North Carolina and Tennessee, and west to Missouri, Iowa, and Wisconsin. In the western United States it has been found in Colorado, Washington, and California (Parsons 1943). Erichson (1843) first recognized this species as occurring in the Nearctic by noting that the specimen sent to him from Connecticut by Zimmerman was not different from specimens he possessed that originated from the Palearctic. This note likely was the basis for Melsheimer's (1846, 1853) record of the species. The common host is nettle (*Urtica* spp., Urticaceae) (Kirk-Spriggs 1996); however, it has been reported from elder (Dillon and Dillon 1961) and sifted from sphagnum moss (Blatchley 1910).

Heterhelus abdominalis (Erichson, 1843)

Carleton Co.: Belleville, Meduxnekeeg Valley Nature Preserve, 46.1931°N, 67.6825°W, 8.VI.2007, M.-A. Giguére & R.Webster, flood plain forest, sweeping (5, RWC); same locality, 25.VI.2007, R.P.Webster, flood plain forest, on flowers of *Prunus virginiana*, (1, RWC); Jackson Falls, Bell Forest, 46.2152°N, 67.7190°W, 11.V.2005, M.-A. Giguére & R.Webster, flood plain forest, sweeping (1, RWC).

Heterhelus abdominalis has been recorded in Canada from Manitoba to Québec (McNamara 1991), and in the United States from New Hampshire and New York, south to Georgia and west to Texas, Arkansas, Missouri, Nebraska, Kansas, and Iowa (Parsons 1943; Downie and Arnett 1996; Chandler 2001). Adults have been found on the flowers of wild plum (*Prunus americana* Marsh.), blackberry (*Rubus* spp.) (Rosaceae), common elder (*Sambucus canadensis* L., Caprifoliaceae), bloodroot (*Sanguinaria canadensis* L., Papaveraceae), and water hemlock (*Cicuta maculata* L., Apiaceae) (Parsons 1943; Dillon and Dillon 1961; Price and Young 2006), as well as under the bark of *Quercus* sp. (A. Cline, pers. obs.).

Heterhelus sericans (LeConte, 1869)

Albert Co.: Shepody National Wildlife Area, Mary's Point Section, 45.7320°N, 64.6765°W, 16.VI.2004, R.P. Webster, on flowers in spruce forest, (8, NBM, RWC);

Carleton Co.: Belleville, Meduxnekeeg Valley Nature Preserve, 46.1965°N, 67.6803°W, 31.V.2005, M.-A. Giguére & R.Webster, old field, sweeping (5, NBM, RWC); **York Co.:** Fredericton, 45.9110°N, 66.6686°W, 4.VI.2004, R.P. Webster, sweeping roadside vegetation near black spruce bog, (7, NBM, RWC).

Heterhelus sericans has been recorded in Canada from British Columbia, Ontario, Québec, Nova Scotia, and Newfoundland (McNamara 1991; Majka and Cline 2006), and in the United States from Maine south to North Carolina and Tennessee, and west to Kansas and Wisconsin (Parsons 1943; Chandler 2001; Price and Young 2006). In Nova Scotia specimens were principally collected in deciduous forests associated with blossoms of *Sambucus racemosa* L. (Caprifoliaceae), *Diervilla lonicera*, P. Mill. (Caprifoliaceae), *Prunus virginiana* L. (Rosaceae), *Crategus* spp (Rosaceae), and *Cornus alterniflora* L.f. (Cornaceae) (Majka and Cline 2006); also reported from *Aristolochia* sp. (Aristolochiaceae) (A. Cline, pers. obs.).

NITIDULIDAE Latreille, 1802

Cillaeinae Kirejtshuk and Audisio, 1986

Colopterus truncatus (Randall, 1838)

Carleton Co.: Hovey Hill, 46.1115°N, 67.7710°W, 7.IX.2004, R.P. Webster, hardwood forest, under poplar bark, (3, NBM, RWC); near the Hovey Hill, 46.1155°N, 67.7631°W, 10.V.2005, R.P. Webster, clearcut, mixed forest, under bark of *Populus* sp., (15, NBM, RWC); Belleville, Meduxnekeeg Valley Nature Preserve, 46.1890°N, 67.6766°W, 8.VI.2005, M.-A. Giguére & R.Webster, flood plain forest, on flowers of *Prunus virginiana*, (1, RWC); **Sunbury Co.:** 7.5 km W of Tracy off Rt. 645, 45.6861°N, 66.7719°W, 9.V.2007, Mixed forest, in litter at base of cut white birch oozing sap, (1, RWC); Lakeville Corner, 45.9013°N, 66.2565°W, 27.VIII.2006, R. P. Webster, silver maple forest, on corncobs, (1, RWC); **York Co.:** Charters Settlement, 45.8395°N, 66.7391°W, 8.IX.2007, Mixed forest, in pile of corncobs and cornhusks, (1, RWC).

Colopterus truncatus has been recorded in Canada from the Yukon east to Nova Scotia (McNamara 1991; Majka and Cline 2006), and it is broadly distributed in the United States south through Central America to Brazil (Parsons 1943). Adults are found under bark and feed on sap (Parsons, 1943) or on molds in subcortical environments (A. Cline, pers. obs.). Price and Young (2006) found the species on large-toothed poplar (*Populus grandidentata* Michx., Salicaceae), and maple (*Acer* sp., Aceraceae).

Carpophilinae Erichson, 1842

Carpophilus brachypterus (Say, 1825)

Sunbury Co.: near Sunpoke Lake, 45.7658°N, 66.5546°W, red oak forest, on flowers of *Viburnum cassinoides*, (3, RWC); **York Co.:** Charters Settlement, 45.8395°N, 66.7391°W, 19.VI.2004, R.P. Webster, mixed forest, on mountain ash flowers, (1, RWC); same locality, 29.VIII.2007, mixed forest, in pile of corncobs and cornhusks, (1, RWC); Canterbury, near Browns Mountain Fen, 45.8964°N, 67.6273°W, 8.IX.2007, mixed forest, on flowers of *Aster umbellatus*, (1, RWC).

Carpophilus brachypterus has been recorded in Canada from Manitoba east to Québec and Nova Scotia (McNamara 1991; Majka and Cline 2006), and in the United States from New Hampshire south to North Carolina and west to Texas, Nebraska, Kansas, Iowa, and South Dakota (Parsons 1943; Chandler 2001). Price and Young (2006) found them on flowers of plum (*Prunus americana* Marsh.), choke cherry (*P. virginiana* L.), apple (*Pyrus malus* L.) (Rosaceae), everlasting (*Antennaria neglecta* Greene), and white snakeroot (*Eupatorium rugosum* Houtt.) (Asteraceae), in leaf litter, on rotting fruit, recently cut hardwoods, on driftwood, scotch pine (*Pinus sylvestris* L.), white pine (*Pinus strobus* L.) (Pinaceae), and willow (*Salix* sp., Salicaceae) in a wide variety of forested and open habitats. Dillon and Dillon (1961) list the species from black haw (*Viburnum prunifolium* L., Caprifoliaceae).

Carpophilus hemipterus (Linnaeus, 1758)

York Co.: Charters Settlement, 45.8395°N, 66.7391°W, 29.VIII.2007, 8.IX.2007, R.P. Webster, mixed forest, in pile of corncobs and cornhusks (local corn), (8, RWC).

In Canada this adventive species has been recorded from British Columbia east to Québec (McNamara 1991), and in the United States it is widely distributed from Washington and California east to Texas and Florida and north to Wisconsin and Maine; also in Alaska (Parsons 1943; Downie and Arnett 1996; Chandler 2001). Horn (1879) remarked that the species was "widely distributed over the region east of the Rocky Mountains." The species was reported from Nova Scotia by Majka and Cline (2006) but only as an intercepted species found on imported corn (*Zea mays* L., Poaceae). This cosmopolitan species has been found on a vast assortment of fresh and dried fruits and stored products including dried fruits such as apples, apricots, bananas, figs, prunes and raisins; fresh fruits and vegetables such as apples, apricots, oranges, dates, grapefruits, limes, maize, melons, pineapples, pears, peaches, persimmons, plums, and tomatoes; on grape skins, sugar, honey, grain, bread, biscuits, rice, avocado seeds, cotton seeds, shelled peanuts, corn meal, sorghum, cloves, and other spices (Hinton 1945).

Carpophilus marginellus Motshulsky, 1858

York Co.: Charters Settlement, 45.8395°N, 66.7391°W, 29.VIII.2007, 5.IX.2007, 21.IX.2007, 5.X.2007, R.P. Webster, mixed forest, in pile of corncobs and cornhusks (local corn), (12, NBM, RWC).

This adventive species originates in Southeast Asia and is frequently associated with dried stored products. In Canada it has been recorded from Manitoba east to Québec and Nova Scotia (McNamara 1991; Majka and Cline 2006), and in the United States from California, Florida, Georgia, Nevada, New Hampshire, New Jersey, Ohio, and Vermont (Downie and Arnett 1996; Chandler 2001). In Great Britain and Scandinavia it has successfully adapted from stored dried products to outdoor environments such as compost heaps (Hammond 1974; Ødegaard and Tømmerås 2000) while in Australia it has colonized peach and nectarine orchards (James et al. 2000).

Carpophilus sayi Parsons, 1945

Carleton Co.: Jackson Falls, Bell Forest, 46.2210°N, 67.7210°W, 2.VI.2005, R. P. Webster, rich Appalachian hardwood forest, UV light trap, (1, RWC); **York Co.:** Charters Settlement, 45.8395°N, 66.7391°W, 11.VI.2003, R.P. Webster, mixed forest, beating foliage, (1, RWC); same locality, 25.IX.2005, 29.VIII.2007, mixed forest, in pile of corncobs and cornhusks, (4, RWC).

Carpophilus sayi has been recorded in Canada from Manitoba, Québec, and Nova Scotia (McNamara 1991; Majka and Cline 2006), and in the United States from Maine south to Georgia, west to Texas and New Mexico, and north to Iowa and Wisconsin; also in California (Parsons 1943; Chandler 2001; Price and Young 2006). The species is frequently taken at sap flows of large-toothed poplar (*Populus grandidentata*), and maple (*Acer* sp.) and is associated with oak wilt fungus mats (Cease and Juzwik 2001; Price and Young 2006).

Epuraeinae Kirejtshuk, 1986

Epuraea aestiva (Linnaeus, 1758) [syn. *Epuraea depressa* (Illiger, 1798)]

Carleton Co.: Belleville, Meduxnekeeg Valley Nature Preserve, 46.1931°N, 67.6825°W, 31.V.2005, M.-A. Giguère and R.P. Webster, upper river margin (floodplain forest), on bloodroot flowers, (1, RWC); same locality, M.-A. Giguère and R.P. Webster, 8.VI.2005, floodplain forest, on foliage of *Prunus virginiana*, (3, RWC); Jackson Falls, Bell Forest, 46.2210°N, 67.7210°W, 9.VI.2005, 20.VI.2005, M.-A. Giguère and R.P. Webster, rich Appalachian hardwood forest, on flowers of *Prunus virginiana*, (2, RWC); same locality, R. P. Webster, 13.VIII.2007, rich Appalachian hardwood forest, on flowers of *Solidago*, (1, RWC); same locality, 7.VI.2007, on flowers of *Vibur-*

num sp. (Adoxaceae); **York Co.:** Canterbury, near Browns Mountain Fen, 45.8951°N, 67.6333°W, 10.VI.2005, M.-A. Giguère and R.P. Webster, mixed forest, on flowers of *Prunus virginiana*, (1, RWC).

This Holarctic species is widely distributed in Europe, northern Asia, and throughout the United States (Parsons 1943, Downie and Arnett 1996). In Canada it has been recorded from British Columbia east to Québec and Nova Scotia (McNamara 1991; Majka and Cline 2006). In Nova Scotia it was found in a great variety of forested and open environments on flowers of trees and shrubs, in compost piles, and at sap (Majka and Cline 2006).

Epuraea erichsoni Reitter, 1873

Carleton Co.: Jackson Falls**,** Bell Forest, 46.2208°N, 67.7211°W, 1.VIII.2004, V. and R. Webster, rich Appalachian hardwood forest, on flowers of *Prunus virginiana*, (1, RWC); **Sunbury Co.:** near Sunpoke Lake, 45.7658°N, 66.5546°W, R.P. Webster, red oak forest, on flowers of *Viburnum cassinoides*, (2, RWC); same locality, R.P. Webster, red oak forest, m.v. light, (1, RWC); **York Co.:** Charters Settlement, 45.8395°N, 66.7391°W,17.VI, 2004, 18.VI.2003, 26.VI.2003, 17.VII.2007, R.P. Webster, mixed forest, m.v light, (3, RWC); same locality, 16.VI.2007, R.P. Webster, mixed forest, on flowers of ornamental *Spiraea* sp., (1, RWC);

Epuraea erichsoni has been recorded in Canada from British Columbia and the Northwest Territories east to Québec and Nova Scotia (McNamara 1991; Majka and Cline 2006), and in the United States from Maine south to Florida and west to Texas and Nebraska (Parsons 1943; Chandler 2001). The species is associated with old-growth forests (Zeran et al. 2006) and is found at sap, under bark and on flowering trees, shrubs, and plants (Parsons 1943). Price and Young (2006) found it on wounded large-toothed poplar (*Populus grandidentata*), and oak (*Quercus* sp.) and on flowers of *Prunus* spp. and tansy (*Tanacetum vulgare* L., Asteraceae). In Nova Scotia it is found at sap, primarily in deciduous forests (Majka and Cline 2006).

Epuraea horni Crotch, 1874

Carleton Co.: Belleville, Meduxnekeeg Valley Nature Preserve, 46.1888°N, 67.6762°W, 27.VIII.2007, R. P. Webster, upper river margin, on flowers of *Daucus* sp., (1, RWC); **York Co.:** Charters Settlement, 45.8395°N, 66.7391°W, 19.VI.2004, R.P. Webster, mixed forest, on mountain ash flowers, (1, RWC).

Epuraea horni has been recorded in Canada from Ontario and Québec (McNamara 1991), and in the United States from Pennsylvania south to North Carolina and west to Illinois (Parsons 1943). No bionomical information is available for this species, but we suspect it to be mycetophagous on various fungal substrata in a similar manner as its close relative *E. helvola*.

Epuraea obliquus Hatch, 1962

This species was reported as occurring in New Brunswick by McNamara (1991). We have not been able to find any specimens or published records of this species collected in New Brunswick. Anthony Davies (pers. comm.) informed us that no specimens from New Brunswick are in the CNC, thus the source of the original report is not established. Consequently, this species is removed from the New Brunswick faunal list.

Epuraea obtusicollis Reitter, 1873

York Co.: Charters Settlement, 45.8430°N, 66.7275°W, 28.VIII.2004, R.P. Webster, regenerating mixed forest, baited with decaying mushrooms, (4, RWC); same locality, 19.IX.2005, R.P. Webster, baited with pile of decaying mushrooms, (1, RWC).

Epuraea obtusicollis has been recorded in Canada from British Columbia east to Québec (McNamara 1991), and in the United States from Maine south to North Carolina and west to Arizona and California (Parsons 1943). The species has been found under the bark of beech (*Fagus* sp., Fagaceae), in fungi, under old leaves, and in humus (Parsons 1943).

Epuraea peltoides Horn, 1879

Albert Co.: Mary's Pt., 45.73°N, 64.67°W, 9.VIII.2002, 12.V.2007, C.G. Majka, compost heap, (2, CGMC); **Carleton Co.:** Jackson Falls**,** Bell Forest, 46.2200°N, 67.7231°W, 18-27.VI.2008, R.P. Webster, rich Appalachian hardwood forest, Lindgren funnel trap, (1, RWC); **Kent Co.:** Kouchibouquac National Park, 30.VIII.1977, S.J. Miller, (1, CNC); **York Co.:** Charters Settlement, 45.8395°N, 66.7391°W,13.IX, 2007, R.P. Webster, mixed forest, in pile of corncobs and cornhusks, (1, RWC).

Epuraea peltoides has been recorded in Canada from Alberta east to Québec and Nova Scotia (McNamara 1991; Majka and Cline 2006), and in the United States south to Virginia and west to Indiana and Wisconsin (Parsons 1943). Price and Young (2006) found it on rotting peaches, and at wounded hardwood trees.

Epuraea rufa (Say, 1825)

Queens Co.: Scotchtown near Indian Point, 45.8762°N, 66.1816°W, 5.VI.2004, R.P. Webster, margin of lake, under drift material, (2, NBM, RWC); same locality, 19.IX.2006, oak forest near lake, in decaying polypore fungi, (1, NBM); **Saint John Co.:** Saint John, VII.1900-07, W. McIntosh, (1, NBM); **Sunbury Co.:** near Sunpoke Lake, 45.7658°N, 66.5546°W, 27.VII.2007, R.P. Webster, oak forest, m.v. light, (7, NBM, RWC); Maugerville: Portobello Creek National Wildlife Area, 45.8992°N,

66.4248°W, 7.V.2004, 27.V.2004, silver maple forest, in moist leaves on margin of vernal pond (12, RWC, NBM); same locality, 18.VI.2004, 17.VII.2004, R.P. Webster, silver maple forest, UVlight, (4, RWC); Acadia Research Forest, 45.9816°N, 66.3374°W, 18.VI.2007, R.P. Webster, mixed forest, sifting leaf litter, (2, NBM, RWC); Lakeville Corner, 45.9013°N, 66.2565°W, 27.VIII.2006, R. P. Webster, silver maple forest, on corncobs, (2, NBM); **York Co.:** Charters Settlement, 45.8395°N, 66.7391°W, 28.VI.2005, R.P. Webster, mixed forest, m.v. light, (1, NBM); Douglas, Keswick R. at Rt. 105, 45.9943°N, 66.8337°W, 18.VI.2004, R.P. Webster, silver maple forest, under debris near margin of small pool, (2, RWC); Fredericton, Saint John River, 4.VII.2004, R.P. Webster, margin of river, drift material, (2, RWC).

Epuraea rufa has been recorded in Canada from Ontario and Québec (McNamara 1991), and in the United States from New Hampshire south to Georgia, west to Missouri, Kansas, Nebraska, and Minnesota, and in Washington and Oregon (Parsons 1943; Kirejtshuk and Pakaluk 1996; Chandler 2001). The species is found in leaf litter, at sap, in fungi, on tree bark, and on driftwood and was also reared from fallen seeds of sugar maple (*Acer saccharum* Marsh., Aceraceae) (Parsons 1943; Price and Young 2006).

Epuraea rufida (Melsheimer, 1846)

Carleton Co.: Jackson Falls**,** Bell Forest, 46.2208°N, 67.7211°W, 31.III.2005, R.P. Webster, rich Appalachian hardwood forest, under bark of dead sugar maple, (9, NBM, RWC); **Saint John Co.:** Saint John, 3.VII.1900-07, W. McIntosh, (1, NBM); **York Co.:** Charters Settlement, 45.8395°N, 66.7391°W, 29.VIII.2007, mixed forest, in pile of corncobs and cornhusks, (10, NBM, RWC).

Epuraea rufida has been recorded in Canada from Ontario, Québec, and Nova Scotia (McNamara 1991; Majka and Cline 2006), and in the United States from Maine south to South Carolina, west to Louisiana, and Wisconsin (Parsons 1943; Chandler 2001; Price and Young 2006). The species has been recorded under bark of oak (*Quercus* sp.) and on the flowers of linden (*Tilia* sp., Tiliaceae) (Parsons 1943). The specimen from Saint John collected by W. McIntosh was determined as *E. rufida* by W.H. Harrington. The specimen is now broken and indeterminate.

Epuraea truncatella Mannerheim, 1846

York Co.: Charters Settlement, 45.8395°N, 66.7391°W, 18.IV.2004, 29.IV.2004, 5.V.2004, 9.V.2004, R.P. Webster, mixed forest, in compost, (12, NBM, RWC); same locality, 30.IV.2004, R.P. Webster, mixed forest, m.v. light, (1, RWC); 17.IV.2005, R.P. Webster, mixed forest, in flight, (1, RPW); Charters Settlement, 45.8188°N, 66.7460°W, 27.III.2005, 16.IV.2005, clearcut, under bark of white pine, (12, NBM, RWC).

Epuraea truncatella has been recorded in Canada from British Columbia and the Yukon and Northwest Territories, east to Québec, Nova Scotia, and Newfoundland and Labrador (McNamara 1991; Majka and Cline 2006), and in the United States in Alaska California, Nevada, Colorado, and New Mexico, east to Indiana, West Virginia, Virginia, New Hampshire, and Maine (Parsons 1943; Chandler 2001). The species is found on the bark of recently dead pines (*Pinus* pp.) (Price and Young 2006). In Nova Scotia it was found at sap on trembling aspen (*Populus tremuloides* Michx., Salicaceae), and under bark of fallen white pine (*Pinus strobus* L., Pinaceae) (Majka and Cline 2006).

Nitidulinae Latreille, 1802

Omosita discoidea (Fabricius, 1775)

Kent Co.: Buctouche, V-VII.2007, J.P. Michaud, mixed forest and agricultural fields, on carrion, (many specimens, UMNB); **York Co.:** Charters Settlement, 45.8395°N, 66.7391°W, 17.IV.2005, R.P. Webster, mixed forest, in flight (1, RWC); same locality, 8.IX.2007, 14.IX.2007, 26.IX.2007, mixed forest, in pile of corncobs and cornhusks, (4, RWC).

This adventive Palearctic species is widely distributed in Europe and is recorded in Canada from British Columbia west to Nova Scotia and Newfoundland and is widely distributed in the United States (McNamara 1991; Majka and Cline 2006; Parsons 1943). *Omosita discoidea* is found on dry carrion, bones, hides, fungi, and in decaying vegetation (Downie and Arnett, 1996).

Nitidula bipunctata (Linnaeus, 1758)

Carleton Co.: Jackson Falls**,** Bell Forest, 46.2152°N, 67.7190°W, 11.V.2005, M.-A. Giguère and R.P. Webster, rich Appalachian hardwood forest, in flight, (1, RWC); **Westmorland Co.:** Moncton, 25.X.1977, E. Ouellette, (1, UMNB); **York Co.:** Charters Settlement, 45.8426°N, 66.7276°W, 9.V.2004, R.P. Webster, regenerating mixed forest, in dried carrion, (10, RWC).

Nitidula bipunctata has been recorded in Canada from the Yukon and British Columbia east to Québec and Nova Scotia (McNamara 1991; Majka and Cline 2006), and in the United States from Maine south to Virginia and Kentucky, west to Texas and north to Michigan, Kansas, Iowa, and Minnesota; also on the Pacific coast from Alaska south to Oregon and Idaho (Parsons 1943; Hatch 1962). Long regarded as an adventive Palearctic species, Majka and Cline (2006) drew attention to the fact that the earliest reports on the continent are from high altitudes in an isolated range of the Rocky Mountains in 1878, a very unlikely location for an introduced species to be found, thus suggesting a possible Holarctic distribution. The species is found on dry carrion (Dillon and Dillon 1961; Downie and Arnett 1996). In Nova Scotia most specimens were found in association with decomposing pigs (*Sus scrofa* Linnaeus) (Suidae) (Majka and Cline 2006).

Lobiopa undulata (Say, 1825)

Kings Co.: Grand Bay, 25.V.2001, D.F. McAlpine, (1, NBM). **York Co.:** Charters Settlement, 45.8395°N, 66.7391°W, 29.VIII.2007, 8.IX.2007, 26.IX.2007, R.P. Webster, mixed forest, in pile of corncobs and cornhusks, (4, RWC); same locality, 1.VIII.2007, mixed forest, m.v. light, (1, RWC).

Lobiopa undulata has been recorded in Canada from Alberta east to Québec (McNamara 1991), and broadly distributed throughout the United States (Parsons 1943). The species is found at sap, under bark, at lights in the spring and fall, and typically overwinters beneath logs (Parsons 1943; Downie and Arnett 1996), and sometimes gregariously in subcortical spaces (A. Cline, pers. obs.). Price and Young (2006) found it on a recently cut maple (*Acer* sp.) stump.

Thalycra concolor (LeConte, 1850)

York Co.: Charters Settlement, 45.8395°N, 66.7391°W, 5.X.2007, R.P. Webster, mixed forest, in pile of corncobs and cornhusks (1, RWC).

Thalycra concolor has been recorded in Canada from Ontario and Québec (McNamara 1991), and in the United States from the District of Columbia, Michigan, Montana, New York, and Wisconsin (Parsons 1943; Downie and Arnett 1996). The species has been found at sap under bark, in fungi and by sweeping grass and flowers (Parson 1943).

Cychramus adustus Erichson, 1843

York Co.: Charters Settlement, 45.8395°N, 66.7391°W, 17.VIII.2005, G. Pohl and R.P. Webster, mixed forest, m.v. light (1, RWC); same locality, 8.IX.2007, mixed forest, in pile of corncobs and cornhusks, (1, RWC).

Cychramus adustus has been recorded in Canada from Ontario and Québec (McNamara 1991), and in the United States from Maine south to Georgia and west to Texas, Missouri, and Michigan (Parsons 1943; Chandler 2001). The species is found on fungi and is also attracted to lights (Downie and Arnett 1996). Price and Young (2006) found it on black-eyed susan (*Rudebeckia hirta* L., Asteraceae).

Cyllodes biplagiatus LeConte, 1866

Carleton Co.: Belleville, Meduxnekeeg Valley Nature Preserve, 46.1940°N, 67.6800°W, 3.VII.2006, R. P. Webster, mixed forest, on slightly dried *Pleurotus* mushrooms on dead standing *Populus* sp., (2, RWC); **Sunbury Co.:** near Sunpoke Lake, 45.7658°N, 66.5546°W, 27.VI.2007, R.P. Webster, oak forest, on slightly dried *Pleurotus* mushrooms on dead standing *Populus* sp., (7, RWC).

Cyllodes biplagiatus has been recorded in Canada from Manitoba (McNamara 1991), and in the United States from New Hampshire south to New Jersey and west to Minnesota (Parson 1943). The species is associated with oyster mushrooms (*Pleurotus ostreatus* Fr., Tricholomataceae) (Cline and Leschen 2005).

Meligethinae C.G. Thomson, 1859

Meligethes nigrescens Stephens, 1830

Albert Co.: Shepody National Wildlife Area, New Horton Section, 45.6940°N, 64.7000°W, 29.VI.2004, R.P. Webster, sweeping on dike near marsh, (3, RPW); **Gloucester Co.:** Hwy 11 at Nord R., 47.7873°N, 65.0796°W, R.P. Webster, salt marsh, sweeping, (1, RWC); **Kent Co.:** Richibucto, 30.VII.1982, L.H. Lutz, (1, NSAC).

This Holarctic species is found throughout the Old World in the British Isles, Europe, North Africa, the Caucasus, Arabia, and east to central Siberia (Easton 1955; Hatch 1957). In Canada it is recorded from the Yukon and British Columbia east to Nova Scotia and Prince Edward Island (Easton 1955; Majka and Cline 2006), and in the United States from Maine south to Maryland and west to Wisconsin, as well as in Oregon (Easton 1955; Price and Young 2006). The species is associated with a wide variety of plants, particularly *Trifolium pratense* L. (Fabaceae) (Easton 1955); Kirk-Spriggs (1996) also noted the host *Trifolium repens* L. (Fabaceae) in Great Britain, suggesting some specificity of the species on members of *Trifoilum*. Price and Young (2006), however, found it on *Spirea* sp. (Rosaceae) and *Rhus* sp. (Anacardiaceae).

Meligethes simplipes Easton, 1947

Carleton Co.: Jackson Falls, Bell Forest, 46.2210°N, 67.7210°W, 12.VII.2004, K. Bredin, J. Edsall, R.P. Webster, rich Appalachian hardwood forest, (1, RWC); same locality, 22.VII.2004, R.P. Webster, rich Appalachian hardwood forest, on flowers, (9, RPW).

Meligethes simplipes has been recorded in Canada from Ontario east to Prince Edward Island and Nova Scotia (McNamara 1991; Majka and Cline 2006), and in the United States from New York south to West Virginia and west to Tennessee and Ohio (Easton 1955). The species is commonly found on flowers of *Rubus canadensis* L. (Rosaceae) and *Syringa* (Oleaceae) (Easton 1955).

Meligethes viridescens (Fabricius, 1797)

Charlotte Co.: near Maces Bay, 45.1245°N, 66.4735°W, 12.VIII.2007, R.P. Webster, Barrier (sea) beach, sweeping vegetation, (14, NBM, RWC).

Majka and Cline (2006) documented the introduction history of this species in North America. The species has previously been reported from Maine, Nova Scotia, Prince Edward Island, and Québec (Hoebeke and Wheeler 1996; Mason et al. 2003), and is found throughout most of Europe, western North Africa, Turkey, the northern Middle East, the Caucasus, and northern Iran east to western Kazakhstan. Larvae feed on many genera of Brassicaceae, particularly *Brassica* spp., *Sinapis* spp., *Cardamine* spp., *Arabis* spp., and *Erucastrum* spp. (Kirk-Spriggs 1996, Majka and Cline 2006). In Europe, it is a widespread and common pest of oilseed rape (*Brassica napus* L. and *Brassica rapa* L.) (Mason et al. 2003). In Nova Scotia it has frequently been found on wild radish (*Raphanus raphanistrum* L., Brassicaceae) (Majka and Cline 2006) and R.P. Webster swept specimens from nettles (*Urtica* sp., Urticaceae) in Maine.

Cryptarchinae C.G. Thomson, 1859

Cryptarcha ampla Erichson, 1843

Carleton Co.: Belleville**,** Meduxnekeeg Valley Nature Preserve, 46.1957°N, 67.6800°W, 14.VII.2004, R.P. Webster, rich Appalachian hardwood forest, UV light trap, (1, RPW); **York Co.:** Charters Settlement, 45.8395°N, 66.7391°W, 25.VI.2003, 26.VI.2003, 19.VII.2005, 26.VII.2005, 12.VII.2006, R.P. Webster, mixed forest, m.v. light, (5, RWC); same locality, 10.VII.2005, mixed forest, at sap flow on *Salix* sp., (1, RWC); **Sunbury Co.:** Lakeville Corner, 45.9013°N, 66.2565°W, 27.VIII.2006, silver maple forest, on corncobs, (1, RWC).

Cryptarcha ampla has been recorded in Canada from British Columbia east to Québec and Nova Scotia (McNamara 1991; Majka and Cline 2006), and in the United States from Maine south to Florida and Alabama, west to Texas, Missouri, Kansas, Iowa, Wisconsin, Colorado, and California (Parsons 1943; Chandler 2001; Price and Young 2006). The species is found at sap flows on maple, oak, hickory, and willow (Parsons 1943; A. Cline, pers. obs.) as well as in fungi and at lights (Downie and Arnett 1996) and is associated with oak wilt fungus mats (Cease and Juzwik 2001). Price and Young (2006) reared a specimen from the stem of a milkweed (*Asclepias syriaca* L., Asclepiadaceae).

Cryptarcha concinna Melsheimer, 1853

Carleton Co.: Jackson Falls, Bell Forest, 46.2199°N, 67.7232°W, 12.IV.2007, R.P. Webster, hardwood forest, in leaf litter at base of tree (1, RWC); **York Co.:** Charters Settlement, 45.8395°N, 66.7391°W, 20.VII.2006, 23.VII.2007, 1.VIII.2007, R.P. Webster, mixed forest, m.v. light, (3, NBM, RWC).

In Canada this species is recorded from British Columbia east to Québec and Nova Scotia (McNamara 1991; Majka and Cline 2006), and in the United States from

Massachusetts south to Florida and west to California and Oregon (Parsons 1943). In Nova Scotia it is found associated with red oak (*Quercus rubra* L., Fagaceae) and red maple (*Acer rubrum* L., Aceraceae).

Glischrochilus confluentus (Say, 1823)

Carleton Co.: Jackson Falls, Bell Forest, 46.2200°N, 67.7231°W, 4-12.VI.2008, R.P. Webster, rich Appalachian hardwood forest, Lindgren funnel trap, (1, RWC).

Glischrochilus confluentus has been recorded in Canada from Ontario, Québec, and Nova Scotia (McNamara 1991; Majka and Cline 2006), and in the United States south to Georgia, west through Missouri, Michigan and Wisconsin, to Colorado and Nevada (Parsons 1943; Price and Young 2006). In Nova Scotia the species was found on bark of a dying trembling aspen (*Populus tremuloides*). Price and Young (2006) found it associated with oak (*Quercus* sp.), on moist decaying fungi, and on chicken of the woods (*Laetiporus sulphureus* (Fr.) Murr., Polyporaceae).

Glischrochilus fasciatus (Olivier, 1790)

Albert Co.: Mary's Pt., 45.73°N, 64.67°W, 21.VI.2003, D.S. Christie, C.G. Majka.; same locality, 12.VIII.2004, 12.V.2007, C.G. Majka, old coastal field, compost heap, (3, CGMC); **Carleton Co.:** Jackson Falls, Bell Forest, 46.2210°N, 67.7210°W, 9.VIII.2006, R.P. Webster, rich Appalachian hardwood forest, on slightly dried *Pleurotus* mushroom on dead standing sugar maple (1, RWC); **Kings Co.:** Grand Bay, 26.V.2001, D.F. McAlpine, (5, NBM); **Saint John Co.:** Saint John, 21.V.1900-07, W. McIntosh, (1, NBM); **York Co:** Charters Settlement, 45.8395°N, 66.7391°W, 3.V.2003, 3.VI.2003, 15.IV.2004, 30.IV.2004, 2.V.2004, 5.V.2004, 10.VII.2005, R.P. Webster, mixed forest in compost, (7, RWC).

Glischrochilus fasciatus has been recorded in Canada from British Columbia, Manitoba, Ontario, Québec, Nova Scotia, and Prince Edward Island (McNamara 1991; Majka and Cline 2006) and in the United States from Maine south to Florida, west through Missouri, Kansas, and Iowa to Oregon; also in New Mexico (Parsons 1943; Chandler 2001). The species is common on fungi, flowers, decaying or ripe fruit (Downie and Arnett 1996) and is associated with oak wilt fungus mats (Cease and Juzwik 2001). Price and Young (2006) found it associated with oak (*Quercus* sp.), poplar (*Populus* sp.), and butternut (*Juglans cinerea* L., Juglandaceae).

Glischrochilus moratus Brown, 1932

York Co: Charters Settlement, 45.8331°N, 66.9410°W, 19.V.2007, 29.V.2007, R.P. Webster, mature red spruce forest, under bark of recently fallen *Populus* sp., (3, NBM, RWC).

Glischrochilus moratus has been recorded in Canada from British Columbia east to Québec and Nova Scotia (McNamara 1991; Majka and Cline 2006), and in the United States in the state of Washington (Downie and Arnett 1996). In Nova Scotia it was found on red maple (*Acer rubrum*) and sugar maple (*A. saccharum* Marsh., Aceraceae) (Majka and Cline 2006).

Glischrochilus quadrisignatus (Say, 1835)

Albert Co.: Harvey Bank, 45.73°N 64.68°W, 25.IX.2005, D.S. Christie, on apples, (1, CGMC); **Carleton Co.:** Belleville**,** Meduxnekeeg Valley Nature Preserve, 46.1925°N, 67.6825°W, 19.IV.2005, R.P. Webster, hardwood forest, leaf litter, sifting, (1, RPW); **Gloucester Co.:** Beresford, 12.VIII.1980, C.A. Boudreau, (1, UMNB); **Madawaska Co.:** Rivière-Verte, 24.VII.1979, G. Grondin, (1, UMNB); **Saint John Co.:** Saint John, 19.V.1900-07, 23.V.1900-07, W. McIntosh, (2, NBM); **Sunbury Co.:** 7.5 km W of Tracy off Rt. 645, 45.6861°N, 66.7719°W, 9.V.2007, Mixed forest, in litter at base of cut white birch oozing sap, (1, RWC); **Westmorland Co.:** Moncton, 17.IX.1994, P. Turgeon, (1, UMNB); **York Co.:** Charters Settlement, 45.8395°N, 66.7391°W, 3.V.2004, 9.V.2004, 16.X.2004, 17.IV.2005, 29.VIII.2007, R.P. Webster, mixed forest in compost, (6, RWC); Douglas, Keswick R. at Rt. 105, 45.9943°N, 66.8337°W, 14.VI.2004, R.P. Webster, silver maple forest, under debris, (1, RWC).

Glischrochilus quadrisignatus has been found in Canada from British Columbia east to Nova Scotia, Prince Edward Island, and Newfoundland (McNamara 1991; Majka and Cline 2006), and in the United States from Maine south to Florida and west through Kansas to Utah and Wyoming (Parsons 1943; Chandler 2001). The species is abundant throughout much of the Maritime Provinces (Majka and Cline 2006) and is attracted to decaying fruit, vegetables, and the odor of anything sweet (Downie and Arnett 1996). Price and Young (2006) found it associated with rotting fruit, corn, dung, carrion, wounded trees, a polypore fungus, and under the bark of black cherry (*Prunus serotina* Ehrh., Rosaceae).

Glischrochilus vittatus (Say, 1835)

Charlotte Co.: S of Little Pocologan R., 45.1731°N, 66.6141°W, 7.V.2007, R.P. Webster, clearcut, under bark of large white pine, (1, RWC); **York Co.:** Charters Settlement, 45.8188°N, 66.7460°W, 27.III.2005, R.P. Webster, clearcut, under and on bark of white pine, adults active and mating (deep snow-pack present), (7, RPW); Charters Settlement, 45.8395°N, 66.7391°W, 29.IV.2006, R.P. Webster, mixed forest, flight intercept trap adjacent to composter, (1, RWC); same locality, 29.IV.2006, mixed forest, in pile of corncobs and cornhusks, (1, RWC).

Glischrochilus vittatus has been found in Canada from British Columbia to Québec and Nova Scotia (McNamara 1991; Majka and Cline 2006), and in the United States

recorded south to California, Nevada, Utah, and Colorado in the west and in North Carolina, New Hampshire, Maine, and Wisconsin (Parsons 1943; Chandler 2001; Price and Young 2006). The species is often found under the bark of pines, *Pinus* spp. (Downie and Arnett 1996). Price and Young (2006) found it associated with red pine (*Pinus resinosa* Ait., Pinaceae).

Discussion

The overall composition of the New Brunswick fauna includes 33 native Nearctic species, four Holarctic species (*Epuraea aestiva*, *E. rufomarginata* (Stephens, 1830), *E. terminalis* Mannerheim, 1843, and *Meligethes nigrescens*), and nine adventive species.

Nine species found in New Brunswick including *Brachypterolus pulicarius*, *Brachypterus urticae*, *Carpophilus hemipterus, C. marginellus, Omosita colon*, *O. discoidea, Nitidula bipunctata, N. rufipes*, and *Meligethes viridescens* are adventive, Palearctic species. These taxa represent nine of the eleven established, introduced species found in Atlantic Canada (19.6% of the fauna). The dates of first detection of these adventive species are summarized in Table 2. The later dates of detection of these species in New Brunswick compared to North America likely reflect a paucity of early collecting for this group in the province.

This research has been conducted in the context of developing better understanding the Coleoptera of the Maritime Provinces of Canada, a fauna which Majka (2008)

Table 2. Dates of first detection of introduced species in New Brunswick

	NB	NA	Source
KATERETIDAE			
Brachypterolus pulicarius (Linnaeus)	1979	1918: NY	Parsons (1943)
Brachypterus urticae (Fabricius)	2004	1843	Erichson (1843)
NITIDULIDAE			
Carpophilinae			
Carpophilus hemipterus (Linnaeus)	2007	1670: MA	Bain (1998)
Carpophilus marginellus Motschulsky	2007	1910: AL	Fall (1910)
Nitidulinae			
Omosita colon (Linnaeus)	1899	1670: MA	Bain (1998)
Omosita discoidea (Fabricius)	2005	1825: NW	Kirby (1837)
Nitidula bipunctata (Linnaeus)	1977	1878: ID	LeConte (1878)
Nitidula rufipes (Linnaeus)	2004	1825: NW	Kirby (1837)
Meligethinae			
Meligethes viridescens (Fabricius)	2007	1945: NS	Majka and Klimaszewski (2004)

Notes: NB, New Brunswick; NA, North America; AL, Alabama; ID, Idaho; MA, Massachusetts; NS, Nova Scotia; NW, Northwest Territories; NY, New York; QC, Québec.

pointed out has been hitherto relatively poorly investigated. In the 17 years since Bousquet (1991) was published, 1,032 species of beetles have been added to the faunal list of Nova Scotia and 555 species to the faunal list of Prince Edward Island (Majka 2008). At least 653 species have been added to the faunal list of New Brunswick (C.G. Majka, unpublished data). All these numbers are indicators of how poorly known the baseline biodiversity of the region has been. The above results add substantially to the known nitidulid and kataretid faunas of New Brunswick. Forty-six species are now known from the province. Although the present study together with that of Majka and Cline (2006) have better defined the nitidulid and kataretid faunas of the region, further research and field work is needed to fully understand the distribution, abundance, and bionomics of this diverse group of beetles in the region.

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